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10/506,560	09/02/2004	Leif Petersen	CM00443C	1302

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EXAMINER	
CHEN, JUNPENG	
ART UNIT	**PAPER NUMBER**
2618	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/506,560	PETERSEN, LEIF	
	Examiner	Art Unit	
	Junpeng Chen	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to applicant's amendment/arguments filed on 10/17/2007. Claim 1 has been amended. Claim 2 has been cancelled. Currently, claims 1 and 2-24 are pending. **This action is made FINAL.**

Response to Arguments

2. Applicant's arguments filed 10/17/2007 have been fully considered but they are not persuasive.

Applicant argues that Ide does not teach the limitation "threshold signal T applies a non-constant transfer function...". However, the rejection was based on Sokal in view of Ide. Sokal not only discloses that the output amplitude of the rf power amplifier 1 is directly proportional to the amplitude of input rf signal 7 (lines 20-26 of column 5), Sokal further discloses the amplitude path transfer function is controllable and non-linear (abstract). Therefore, Sokal in combination with Ide discloses the limitation above.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Response to Amendments

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-10, 15-20, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sokal (U.S. Patent 3,900,823)** in view of **Ide et al. (U.S. Patent 5,955,921)**.

Consider **claim 1**, Sokal discloses an RF amplifier circuit comprising an RF amplifying device *(read as an amplifier stage of power amplifier 1 with comparator function, line 64 of column 24 to line 15 of column 25)* having

a first input terminal *(read as the input terminal that accepts INPUT in the amplifier stage of power amplifier 1, Figure 1)*,

a second input terminal *(read as input terminal that accepts the threshold (cutoff voltage), Figures 1, 11A-11B, line 64 of column 24 to line 50 of column 25)*,

an output terminal *(read as output of power amplifier 1, Figure 1)*,

means for applying to the first input terminal an input RF signal I to be amplified *(read as the inherently existing element that supplies INPUT, Figure 1)*,

means for applying to the second input terminal a threshold signal T, wherein the threshold T applies a non-constant transfer function to a signal representation of the input RF signal I *(read as the inherently existing element that supplies the threshold and amplitude path transfer function is controllable and non-linear (abstract), Figures 1, 11A-11B)*, and

the amplifying device being operable to produce at the output terminal an output signal O which has a high finite value providing a Boolean `1` value when the instantaneous value of the amplitude of I is greater than the threshold signal T and a low finite value providing a Boolean `0` value when the instantaneous value of the amplitude of the input RF signal I is less than the threshold signal T *(read as the comparator function in as shown in Figures 10A-10F is performed by amplifier stage of power amplifier 1 and the output of the comparator is "on" or "off", Figures 10A-10F, lines 27-68 of column 24)*,

However, Sokal fails to discloses a mean for generating and applying the second input terminal a threshold signal T and that wherein the threshold signal T is dynamically varied in a manner adapted to linearize the relationship in at least part of its

range between the amplitude of the output signal O and the amplitude of the input RF signal I.

Nonetheless, in related art, Ide discloses a signal amplifier circuit comprising automatic threshold values setting portion for outputting variable threshold values based on the peaks of the INPUT and/or the feedback loop 28 in Figure 5, to the amplifier so the amplifier maintains/obtains linearity, Figures 5, 17(a) and 17 (b), abstract, lines 19-30 of column 19, and lines 29 – 67 of column 31.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to incorporate the teachings of Ide into the teachings of Sokal for the purpose of obtaining linearity of the amplifier.

Consider **claim 4**, **as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the output terminal is connected to a low pass filter operable to filter out harmonics higher than the first harmonic in the output signal O *(read as RF harmonics of the output is eliminated by low-pass filtering, lines 36-48 of column 5)*.

Consider **claim 5**, **as applied to claim 1 above**, Sokal, as modified by Ide, further discloses wherein the threshold signal T is controlled to be a variable signal having a constant sign *(read as the threshold is between the bottom and peak value,* Figures 17(a) and 17 (b), abstract, lines 29 – 67 of column 31 of Ide*)*.

Consider **claim 6**, **as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the threshold signal T is in operation dynamically varied as a function of the input RF signal I by sampling the input RF signal I prior to application to the

amplifying device, the means for generating and applying to the second input terminal a threshold signal T including a feed forward loop which includes means for deriving at least part of the threshold signal T from the input RF signal I *(read as the thresholds is based on the peak values of the INPUT and the threshold is variable, Figures 17(a) and 17 (b), abstract, lines 29 – 67 of column 31 of Ide).*

Consider **claim 7, as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the threshold signal T is dynamically varied as a function of the output signal O by sampling the output signal O produced by the amplifying device, and wherein the means for generating and applying to the second input terminal a threshold signal T further comprises a feedback loop which derives a signal in part from the sampled output signal O *(read as the path including attenuator 3 and amplitude 2 is taken into consideration, Figures 1, 11A-11B, line 3 of column 5-33 of column 5).*

Consider **claim 8, as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the means for generating and applying to the second input terminal a threshold signal T is operable to produce from the input RF signal I a signal which is related to an envelope of the input RF signal I *(read as the thresholds is based on the peak values of the INPUT and the threshold is variable, Figures 17(a) and 17 (b), abstract, lines 29 – 67 of column 31 of Ide).*

Consider **claims 9 and 10, as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the means for generating and applying to the second input terminal a threshold signal T further comprises a digital signal processor operable to calculate from modulation information applied to produce the input RF signal I a form of

the input RF signal I as in claim 9 and wherein the circuit further comprises a digital signal processor operable to produce modulation information for use in modulation to form the input RF signal I and also to carry out calculations using the modulation information to derive at least part of the threshold signal T as in claim 10 *(read as the amplitude/phase modulated INPUT is used to determine the threshold, Figures 17(a) and 17 (b), abstract, lines 29 – 67 of column 31 of Ide).*

Consider **claim 18**, **as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein in operation the threshold signal T is applied as a variable bias to the amplifying device or is combined with the input RF signal I at an input to the amplifying device (*read as the amplifier performs amplification depending on the threshold, Figures 17(a) and 17 (b), abstract, lines 29 – 67 of column 31 of Ide).*

Consider **claim 19**, **as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the amplifier circuit includes at least two amplifying devices mutually connected in series or in parallel *(read as power amplifier 1 and Diff. Amplifier 4, Figure 4).*

Consider **claim 20**, **as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the amplifier circuit is used in a communications transmitter (read as the radio communications or transmitting systems, lines 42-46 of column 1).

Consider **claim 22**, **as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the amplifier circuit is operable to employ phase modulated RF

signals (read as an phase modulator and has phase modulated RF signals, line 3-8 of column 4).

Consider **claim 24, as applied to claim 1 above**, Sokal, as modified by Ide, discloses the amplifier circuit which is such that a plot of amplitude of the output signal O against amplitude of the input RF signal I is linear (read as the output signal 13 is very nearly proportional to the input signal 7, and the amplifier system is very nearly linear, lines 40-47 of column 5).

However, Sokal, as modified by Ide, fails to specifically disclose that the amplifier circuit is operable to provide a linear response in an output signal strength range of at least 70dB.

Nonetheless, the amplifier system by Sokal, as modified by Ide, is very nearly linear; it would be capable to provide a linear response in an output signal strength range of at least 70dB.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to use Sokal's invention, which modified by Ide, to provide a linear response in an output signal strength range of at least 70dB because the amplifier system is nearly linear.

Consider **claim 3, as applied to claim 1 above**, Sokal, as modified by Ide, discloses the amplifier circuit which has a bandwidth greater than the mean operating frequency of the input RF I signal which it is operable to amplify *(read as the f_s of*

amplifier 1 is 2 times as large as the instantaneous radio frequency, Figures 10A-10F, lines 27-35 of column 24 and lines 34-50 of column 25).

However, Sokal, as modified by Ide, fails to discloses that the amplifier has a bandwidth that is at least five times greater than the operating frequency of the input RF I signal.

Nonetheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to design the amplifier to have a bandwidth that is at least five times greater than the operating frequency of the input RF I signal, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Consider **claim 15**, **as applied to claim 1 above**, Sokal, as modified by Ide, discloses the amplifier circuit which is such that a plot of amplitude of the output signal O against amplitude of the input RF signal I is linear (read as the output signal 13 is very nearly proportional to the input signal 7, and the amplifier system is very nearly linear, lines 40-47 of column 5).

However, Sokal, as modified by Ide, fails to specifically disclose that it is linear over at least 90% of its range.

Nonetheless, the amplifier system by Sokal, as modified by Ide, is very nearly linear, the examiner interprets it as it is linear over at least 90% of its range in a plot of amplitude of output signal O against amplitude of the input RF signal is linear.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to plot the amplitude of the output signal O against

amplitude of the input RF signal I of Sokal's amplifier system, which modified by Ide, and obtain a plot which it is linear over at least 90% of its range because the amplifier system is very nearly linear.

Consider **claim 16, as applied to claim 1 above**, Sokal, as modified by Ide, discloses wherein the amplifying device employed in the circuit is arranged in a class C configuration so that in operation the input RF signal I and the threshold signal T are applied together via separate input terminals to the electrodes of the amplifying device (read as power amplifier would be a class C amplifier and the dc bias level and RF input drives magnitude supplied to the control electrodes of the amplifier, lines 46-55 of column 19, lines 5-10 of column 23, lines 20-25 of column 23, and lines 5-10 of column 25).

However, Sokal, which modified by Ide, fails to specifically disclose that the two separate input terminals to be combined at a single electrode of the amplifying device.

Nonetheless, it would have been an obvious matter of design choice to design two separate input terminals to be combined at a single electrode of the amplifying device since the applicant has not disclosed that having two separate input terminals to be combined at a single electrode of the amplifying device solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the two separate input terminals to electrodes of the amplifying devices.

Consider **claim 17, as applied to claim 1 above**, Sokal, as modified by Ide, discloses the above claimed invention but fails to disclose wherein the amplifying device comprises a solid state amplifying device.

However, the Examiner take Office Notice of the fact that solid state amplifier are widely used in the art for its well-known advantage of low power consumption.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to use solid-state power amplifier in Sokal's invention, which modified by Ide, for the purpose of low power consumption.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sokal et al. (U.S. Patent 3,900,823)** in view of **Ide et al. (U.S. Patent 5,955,921)** and in further view of **Hotta et al. (U.S. Patent 4,803,440).**

Consider **claim 11, as applied to claim 1 above**, Sokal, as modified by Ide, discloses the claimed invention above and means for generating and applying to the second input terminal a threshold signal T and a signal peak monitor which is operable to measure a value of a peak of a signal being sampled and produces a peak envelope signal (read as amplitude detector 2, Figure 1).

However, Sokal, which modified by Ide, fails to discloses the means for generating and applying the second input terminal a threshold signal T further comprising: an analogue to digital converter which is operable to digitize the peak envelope signal; a digital signal processor which is operable to apply a transform function to the digitized peak envelope signal; and a digital to analogue converter which is operable to convert the digitally transformed signal produced by the digital signal processor back into a waveform suitable for use as the threshold signal T.

However, in related art, Hotta discloses a control circuit which receive output from Power amplifier 3, and having a amplitude detector 42, A/D converter 43, Microprocessor having a CPU and RAM/ROM, D/A converter, and to control the power, Figures 1, 1A and 2, line 12 of column 4 to line 39 of column 6.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to incorporate the teachings of Hotta et al. into the teachings of Soka, which modified by Ide, to use the control circuit by Hotta for the purpose of automatically controlling the power of the power amplifier.

Consider **claim 12**, **as applied to claim 11 above**, Sokal, as modified by Ide and Hotta, discloses wherein the means for generating and applying to the second input terminal a threshold signal T further comprises an amplifier or a plurality of amplifiers to amplify the signal to produce as the threshold signal T which is variable *(read as error amplifier circuit 30, Figure 5, lines 19-30 of column 19 of Ide)*.

Consider **claim 13**, **as applied to claim 11 above**, Soka, as modified by Ide and Hotta, further discloses wherein the mean for generating and applying to the second input terminal a threshold signal T is operable to apply proportional, derivative and integral control to produce the threshold signal T (read as the output RF signal is proportional to the amplitude of the input RF signal, therefore, PID method could be used, lines 29-36 of column 3, lines 20-27 of column 5 and lines 40-47 of column 5).

Consider **claim 14**, **as applied to claim 11 above**, Sokal, as modified by Ide and Hotta, fails to disclose the RF amplifier circuit which stores corresponding values of the signal before and after application of the transfer function.

However, Hotta's disclosure of a power control circuit above comprises a RAM/ROM, which is for storing data.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to incorporate the teachings of Hotta into the teachings of Sokal, which modified by Ide and Hotta, to use the RAM/ROM by Hotta to stores the corresponding values for the purpose of storing wanted data.

Claims 21 and **23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sokal et al. (U.S. Patent 3,900,823)** in view of **Ide et al. (U.S. Patent 5,955,921)** and in further view of **Gourgue et al. (U.S. Patent 5,625,322).**

Consider **claim 21**, **as applied to claim 2 above**, Sokal, which modified by Ide, discloses wherein the amplifier circuit is for transmitting system (lines 42-46 of column 1) but fails to specifically disclose it is used in a mobile station or a base transceiver station.

Nonetheless, in related art, Gourgue discloses the use of a power amplifier in a cellular mobile system, which is for TERTA system, lines 4-15 of column 1.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to incorporate the teachings of Gourgue into the teachings of Sokal, which modified by Ide, to use amplifying apparatus in a cellular mobile system in a TERTA system for the reason of obtaining high linearity relationship between the input and output of the amplifying apparatus.

Consider **claim 23**, **as applied to claim 2 above**, Sokal, as modified by Ide, discloses wherein the amplifier circuit is for transmitting system (lines 42-46 of column

1) but fails to specifically disclose wherein the amplifier circuit is incorporated in a mobile station or base transceiver station for use in a mobile communications system operable according to TETRA standards.

Nonetheless, in related art, Gourgue discloses the use of a power amplifier in a cellular mobile system, which is for TERTA system, lines 4-15 of column 1.

Therefore, it would have been obvious for a person with ordinary skill in the art at the time the invention was made to incorporate the teachings of Gourgue into the teachings of Sokal, which modified by Ide, to use amplifying apparatus in a cellular mobile system in a TERTA system for the reason of obtaining high linearity relationship between the input and output of the amplifying apparatus.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junpeng Chen whose telephone number is (571) 270-1112. The examiner can normally be reached on Monday - Thursday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Junpeng Chen
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